

REMARKS

Applicant recognizes with appreciation that the Examiner had a telephone interview with the representative of Applicant on March 5, 2010. During the interview, the differences between the present invention as claimed and the prior art of record were discussed. The Examiner agreed that the rejections based on prior art of record have been overcome.

The Office Action of October 14, 2009 has been received and carefully considered. Applicant respectfully disagrees with the obviousness rejection based on the prior art of record. All claims are now present for examination and favorable reconsideration is respectfully requested in view of the previous amendments and the following comments.

REJECTIONS UNDER 35 U.S.C. § 103:

Claims 15 – 18, 20 – 22 and 26 – 32 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Martin (US Pat. 6,298,232) in view of Hamalainen et al. (US Pat. 6,570,860). Claims 23-25 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Martin in view of Hamalainen and further in view of Vogel (US Pub. 2002/0077786). Claim 19 has been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Martin in view of Hamalainen and further in view of Smith (US Pub. 2003/0069031). Claims 18, 27 and 21 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Martin in view of Hamalainen and further in view of Comer et al. (US Pat. 6,856,808). Claim 33 and 34 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Martin in view of Hamalainen and further in view of Granstam et al. (US Pat. 6,587,691).

Applicant traverses the rejection and respectfully submits that the embodiments of present-claimed invention are not obvious over cited references. The previous response of July 31, 2010 is hereby incorporated by reference. In summary:

- Martin does not disclose “*an SMSC of the foreign network querying a pseudo HLR in the home network, said pseudo HLR operating with the protocol of the foreign network, to determine a serving MSC*” (designated as step (a) in the Office Action). Instead, Martin uses the real HLR. For example, in Fig. 5 of Martin, the SMSC of the foreign (GSM) network queries its own GSM HLR. In Claim 1 of the present application, the query goes to a **pseudo HLR** in the home network (which would be IS-41 in Martin) operating with the protocol of the foreign network.
- Martin does not disclose “*the pseudo HLR providing to the foreign network SMSC an address of a pseudo MSC in the home network, said pseudo MSC operating with the protocol of the foreign network*” (designated as step (b) in the Office Action) or “*the foreign network SMSC routing the message to the pseudo MSC, wherein the pseudo MSC terminates the message delivery attempt by sending an acknowledgement to the foreign network SMSC*” (designated as step (c) in the Office Action). It does not have a **pseudo HLR** as claimed and nor does it have a **pseudo MSC** as claimed. Instead, it uses the conventional foreign network (GSM) MSC (GSM in the example of Fig. 5 of Martin)
- Martin does not disclose “*a mobile network node in the home network performing protocol conversion of the message to an access protocol and routing the message using said access protocol to a receiving node in the home network*” (designated as step (d) in the Office Action). In Martin, protocol conversion is performed by an IWF residing between the two networks, not as claimed by a node in the home network.

The present invention avoids the approach of Martin because Martin's approach required that the originating network (foreign network) must have its HLR updated with location information about the users in the destination (home) network. With the present invention, there is no need for an inter-working gateway to reside between the originating and all possible destination networks. The originating SMSC can make a query to the same-technology HLR in the destination network.

With regard to Hamalainen, it merely relates to a TDMA system with details about how time slots are managed. Hamalainen mentions sending an acknowledgement. However, there is no disclosure or suggestion of terminating a message delivery attempt as defined in Claim 15. Particularly, as stated above, Martin does not disclose any of the other features of Claim 15.

As elaborated in the previous response of July 30, 2009, Applicant respectfully submits that it is incorrect at section (a) of the Office Action on page 3. Considering, as in Action, the GSM network as the foreign network, the SMSC of the foreign network does not query a pseudo HLR in the home network. As illustrated in Fig. 5 the query is a conventional query to the foreign (GSM) network.

Regarding sections (b) and (c) of the Action on page 3, Applicant disagrees that the second and third sub-paragraphs of claim 15 are anticipated. According to Marin at col. 4 line 50 to col. 5 line 2 the foreign (GSM) network SMSC sends the message to the VMSC of the home network (IS-41). It does not send it to an equivalent of *a pseudo MSC in the home network operating with the protocol of the foreign network*. The IWF does handle the forwarded message but this message is not addressed to the IWF. The IWF merely handles the message as an intermediary protocol converter *en route* to the serving VMSC (or its equivalent) in the home network where the subscriber device is located. The VMSC, or its equivalent, in the home network does not operate with the protocol of the foreign network.

In addition, Claim 15 include the following feature – “the pseudo MSC terminates the message delivery attempt by sending an acknowledgement to the foreign network SMSC.” Applicant has found no anticipation or suggestion of this aspect in Marin or Hamalainen. Even if one interpreted (wrongly in our view) the IWF as an equivalent of the claimed pseudo MSC, then it does not terminate the message. The message very clearly goes on through the IWF to the serving MSC/VLR (or its equivalent e.g. VMSC) of the home network where the subscriber device is currently located and as illustrated in Fig. 11 (and Fig. 5) the acknowledgement (e.g. MT FORWARD SM ACK in Fig. 11) for

the message delivery attempt clearly comes from the serving MSC/VLR (or its equivalent e.g. VMSC in Fig. 5) in the home network as described in col. 8 lines 27-33.

Furthermore, there is no disclosure or suggestion in Marin of the last aspect of claim 15. As is very clear from Fig. 5 and the accompanying description, the protocol conversion is performed by the IWF, not a node in the home network, and of course not after the message has been terminated with the response indicating such being sent to the originating foreign network SMSC as now claimed in the independent claims.

Remarks Supporting Allowability of the Independent and Subsidiary Claims

In more detail, the invention as claimed in the independent claims is best understood with reference to Fig. 4 of present application's specification. The virtual mobile node of the invention plays a controlling role and not merely a conversion role. In step 2, the pseudo HLR is queried for routing information and provides an address, and this address is of the pseudo MSC. This allows the virtual mobile node to play a controlling role, and indeed it terminates the message as described with reference to steps 4 and 5, page 7, lines 9-10 and 21-23; and page 10, lines 15-17 and page 11, lines 1-2. Please also refer to page 9 line 25 to page 10 line 3. The virtual mobile node sends an acknowledgement (signal 5 in Fig. 4), and hence the message delivery attempt is terminated at the virtual mobile node.

As the mobile network node of the invention is in a controlling position, this allows a wide range of functions to be usefully performed including those based on errors returned in signals from the virtual mobile node, such as those described in page 8 lines 15-16, page 9 lines 4-6, page 11, line 22; and in page 12 lines 10 to 23. Thus for example the VMN can respond to a message forwarded to it with an error code indicating "Destination out of Service", or "SMS Termination Denied" or "Network resource shortage" and the latter can be used for throttling, thus enabling operators to implement inter-network policies such as traffic buffering at an agreed rate which means that such inter-working does not have adverse effects such as swamping network resources with inter-working traffic.

By contrast, referring to Fig. 11 (or Fig. 5) of Marin, the sending element in the foreign network sends the message directly to the serving MSC/VLR (or its equivalent) in the home network where the subscriber device is currently located as described in col. 8 lines 27-33. As illustrated in Fig. 5 and Fig. 11, the Marin IWF does not perform message termination, acting merely as a pass through protocol converter.

Thus, in *Marin et al* the receiving network very disadvantageously does not have direct control over incoming messages, and since *Marin et al* does not enable operators to implement inter-network policies such as traffic buffering at an agreed rate the solution proposed in *Marin et al* means that adverse effects such as swamping network resources with inter-working traffic are a real risk.

Marin demonstrates merely transaction mode for voicemail notification with protocol conversion. The transaction mode is in this case end-to-end response from the terminating entity, in this case the serving MSC/VLR in the home network where the subscriber device “is currently located” ... “indicating whether the mobile station has received the voice message notification”. Please refer to col. 8 lines 27-33 of Marin

Receiving Node Services

As already described, the present invention provides a controlling gateway (elements of the “virtual mobile node”, namely the pseudo HLR and pseudo MSC) for incoming messages into the home network. All messages are received by the pseudo MSC and having been successfully terminated there are subsequently forwarded to the receiving node. This is very advantageous for control purposes such as filtering out spam messages. For example, where the receiving node is an SMSC the home network can avail of the rich services which an SMSC in the home network can provide, such as message storage, segmentation, retry, address translation etc.

By contrast, *Marin et al* cannot avail of features provided by intermediate elements such as controlling features of the mobile network node of the invention or rich functionality of an SMSC in the home network, as in *Marin et al* the sending element in

the foreign network sends the message directly to the receiving device via the serving MSC/VLR (or its equivalent) in the home network where the subscriber device “is currently located” as described in col. 8 lines 27-33 and Fig. 5 and Fig. 11.

Seamless Inter-working

The foreign network can communicate/interoperate seamlessly (i.e. without protocol conversion) with the home network. This is via the pseudo HLR and pseudo MSC elements of the home network. Thus, the invention allows inter-working between different networks, without the foreign network needing to perform protocol conversion to interoperate with the home network.

In contrast, in *Marin et al.*, the originating SMSC communicates with the local HLR in its own network, and since it is doing direct delivery via the VMSC (or its equivalent) in the other network, protocol conversion is required for it to communicate with that VMSC and it is for this reason that the IWF is required. Additionally, the operator needs to provide a mechanism to re-direct to the IWF.

Thus, as described in page 5 lines 22 to 26, our invention presents HLR and MSC functionality in a home network to a foreign network. This is very efficient for sending a message from the foreign network to the home network. Also, the protocol conversion is performed fully within the home network and so a single (“access”) protocol such as SMPP can be used by the mobile network node for communicating with other elements in the home network such as the SMSC. Thus the mobile network node of the invention can be deployed in the home network in a manner which has minimal impact on the other elements of the home network and on the foreign network. This greatly simplifies deployment of inter-working capability in an operator’s home network.

Another advantage is that the functionality provided in claim 27 provides for the home network SMSC to send a message destined for the foreign network to the node via the access protocol. Thus the node can act as a central point in the home network for protocol conversion and onward delivery to a recipient in the foreign network.

Thus, the mobile network node can advantageously use a conventional signalling technology such as SS7 for both sending to and receiving messages from the foreign network, without the foreign network needing to perform protocol conversion to interoperate with the home network.

SS7 to Access Protocol Offload (claims 19 to 21, and claims 33 to 35)

As well as active congestion control our invention by essentially enabling offloading from SS7 to an access protocol, i.e. offload from SS7 signaling to a service centre access protocol such as (SMPP)/IP (refer to page 4 line 28 to page 5 line 9) automatically allows operators control of and maximum use of scarce signalling resources as they are not required in the home network for the submission leg to the inter-working gateway and the SMSC. In contrast, in *Marin et al*, the fact that there is no congestion control provided by the IWF is a particular problem because messages are being directly delivered onto the home SS7 signaling network.

For the reasons given above, it is respectfully submitted that *Marin* could not fairly be used as a basis for an obviousness rejection in combination with *Comer* and/or *Vogel* and/or *Smith*. Even if one were to combine the disclosure of any of these additional references with it, one would still not arrive at the present invention as claimed.

In summary, a key aspect to be considered for patentability of claims 15, 26, and 32 is that the *Marin et al* sending element in the foreign network sends the message directly to the receiving device via the serving MSC/VLR (or its equivalent) in the home network where the subscriber device “is currently located” as described in col. 8 lines 27-33, and Fig. 5 and Fig. 11. Thus, in *Marin et al* the home network does not have direct control over incoming messages, and cannot avail of controlling features of the mobile network node of the invention or features such as rich functionality of an SMSC in the home network. Hence, *Marin* does not form a basis for the obviousness rejections, particularly in view of the additional limitations being now added to the independent claims.

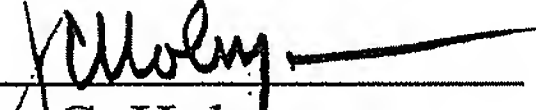
Therefore, the newly presented claims are not obvious over cited references and the rejection under 35 U.S.C. § 103 has been overcome. Accordingly, withdrawal of the rejections under 35 U.S.C. § 103 is respectfully requested.

Having overcome all outstanding grounds of rejection, the application is now in condition for allowance, and prompt action toward that end is respectfully solicited.

Respectfully submitted,

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